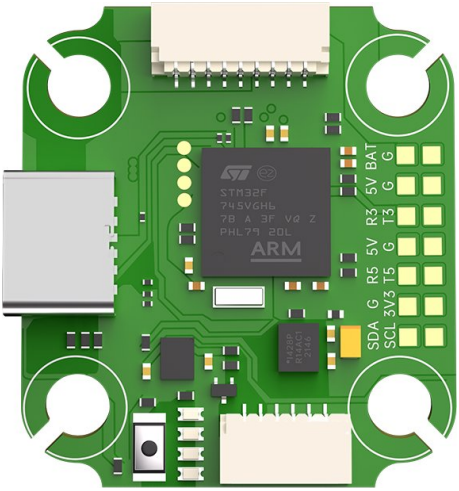
ROTORAMA

BLITZ Mini F745

Flight controller (FC) for FPV drones
iFlight · 20 × 20 mm mounting pattern



Read this entire manual carefully before installation and first power-up. Always remove the propellers before working on the drone with a battery or USB cable connected.

User manual · www.rotorama.com

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1. Safety instructions

1.1 Before you start

The iFlight BLITZ Mini F745 is a flight controller (FC) designed to be built into an FPV drone. It is not a ready-to-fly product – installation requires soldering, connecting further components (ESC, receiver, video transmitter, camera) and configuration on a computer. If you have no experience with this, ask an experienced modeller for help.

- Before installation, read this entire manual and the manuals of all components to be connected.
- The product is not a toy and is not intended for children. Keep it out of the reach of children – it contains small parts that could be swallowed.
- The manufacturer states that the product is intended for recreational use and does not support autonomous flight.

1.2 Electrical safety and installation

- Solder only on a disconnected device – without a battery and without a USB cable. Solder quickly and do not overheat the pads, they may lift off.
- Before connecting a battery for the first time, use a multimeter to check that there is no short circuit between the power leads (BAT and GND) and check the polarity of all power connections.
- For the first power-up we recommend connecting the battery through short-circuit protection (a so-called smoke stopper) or a current-limited bench power supply.
- The connector for DJI digital video transmitters passes the battery voltage (VBAT) straight through. Check that the connected transmitter can handle the voltage of your battery – see Chapter 3.3.
- Mount the flight controller on rubber damping grommets and make sure the board does not touch the carbon frame – carbon is electrically conductive.
- Do not load the BEC output with a current higher than stated in Chapter 2.2.

1.3 Propellers and motors

- Whenever you work on the drone with a battery or USB cable connected – configuration, motor test, firmware update – **the propellers must be removed**.
- Spinning propellers can cause serious injury. Never hold the drone in your hand with propellers fitted when you Arm it (switch the motors on).
- After wiring, always check the motor order and direction of rotation (Chapter 5.3).

1.4 Li-Po and LiHV batteries

The flight controller has no battery of its own; it is powered from the drone's battery via the ESC. Follow these rules when handling Li-Po and LiHV batteries:

State	Li-Po	LiHV
Fully charged	4.20 V/cell	4.35 V/cell
End the flight	3.5 V/cell	3.5 V/cell
Storage	3.8 V/cell	3.8 V/cell

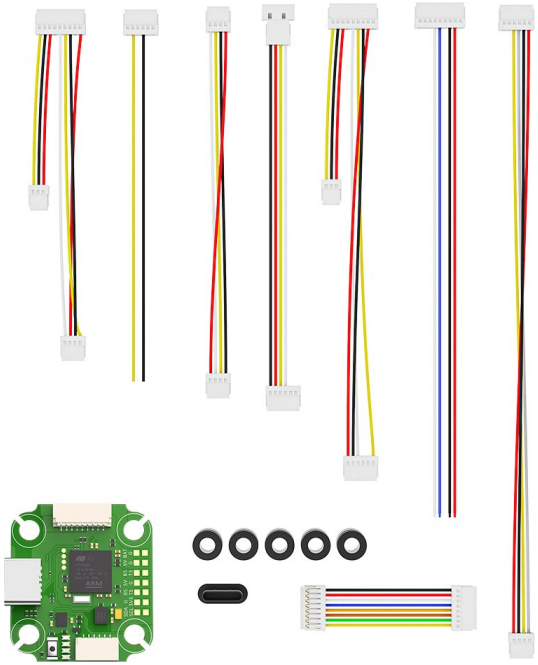
The voltage of the whole pack is the per-cell value multiplied by the number of cells (e.g. a fully charged 4S Li-Po = 16.8 V).

- Charge batteries under supervision, on a non-flammable surface and with a charger designed for the given cell type.
- Do not use swollen, damaged or overheated batteries.
- Disconnect the battery from the drone after flying and during storage. For longer storage, bring it to storage voltage.

2. Product description

2.1 Package contents

1 pc	iFlight BLITZ Mini F745 flight controller
set	Connection cables with SH1.0 connectors and small mounting accessories as shown below



Package contents according to the product photo. The accessories may vary between production batches.

Not included: ESC, receiver, video transmitter, camera, GPS module, battery and USB-C cable.

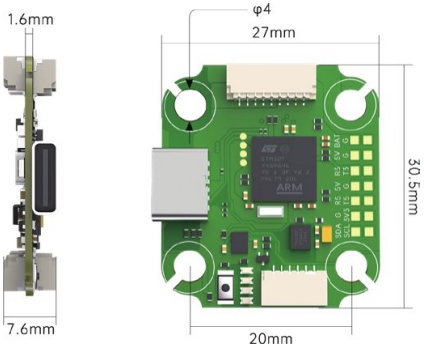
2.2 Specifications

Parameter	Value
MCU	STM32F745
Gyro	ICM42688
Barometer	DPS310
OSD	AT7456E
Blackbox memory	16 MB

Parameter	Value
BEC 5 V	2.5 A continuous, 3 A peak (15 s)
UART	6 (UART1–UART6)
Motor outputs	4 × DShot / PWM
I2C bus	1 ×
VTX control	SmartAudio, IRC Tramp
WS2812 LED strip	yes
Buzzer	yes
USB connector	USB-C
Dimensions	30.5 × 27 mm
Mounting pattern	20 × 20 mm, Ø 4 mm
Weight	4.8 g
Betaflight firmware	target IFLIGHT_BLITZ_F7_AIO
ArduPilot firmware	arduplane_with_bl (original manual), board BLitzMiniF745 (manufacturer's website)

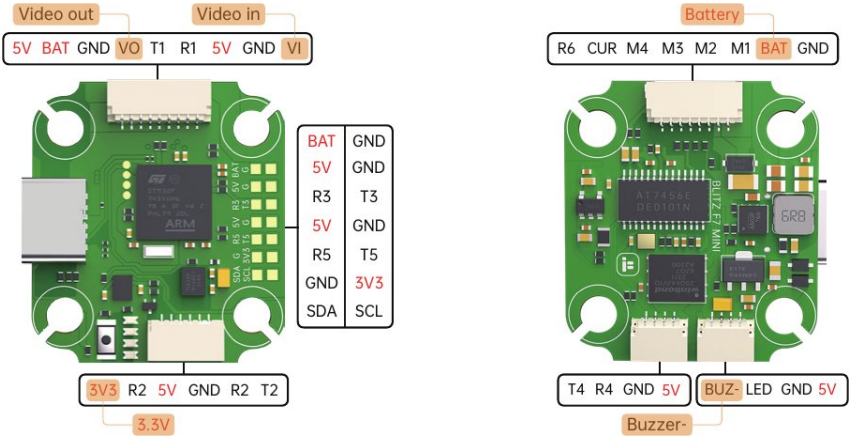
※ The manufacturer's original manual also lists a 9 V BEC output (2.5 A continuous, 3 A peak for 15 s). However, no output labelled 9 V is marked in the manufacturer's wiring diagrams; the video transmitters shown there are powered from the battery voltage (BAT/VBAT).

2.3 Dimensions



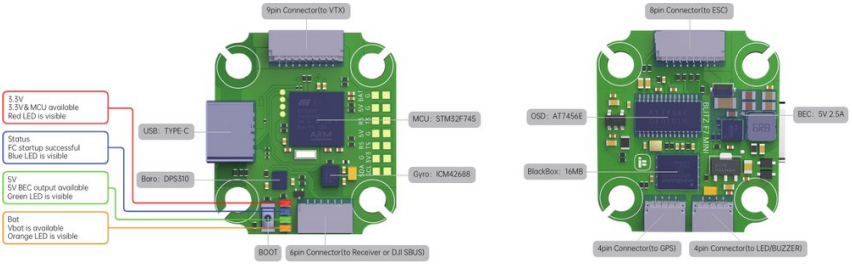
Flight controller dimensions (mm): board 30.5 × 27, mounting pattern 20 × 20, board thickness 1.6, overall height 7.6.

2.4 Connectors and solder pads



Pinout – top side of the board on the left, bottom side on the right.

Connector	Pin assignment
SH1.0, 9-pin – HD VTX / analog VTX and camera	5V / BAT / G / VO / T1 / R1 / 5V / G / VI
SH1.0, 8-pin – ESC	R6 / CUR / M4 / M3 / M2 / M1 / BAT / G
SH1.0, 6-pin – receiver or DJI	3V3 / R2 / 5V / G / R2 / T2
SH1.0, 4-pin – GPS	T4 / R4 / G / 5V
SH1.0, 4-pin – LED and buzzer	BUZ− / LED / G / 5V
Solder pads	BAT, 5V, R3/T3, R5/T5, 3V3, SDA/SCL, GND



Main components, connectors, BOOT button and indicator LEDs (manufacturer's labels).

2.5 Indicator LEDs

LED	Meaning when lit
red	3.3 V supply and MCU are available
blue	status – flight controller started up successfully
green	5 V BEC output is available
orange	battery voltage (Vbat) is present on the board

2.6 Recommended UART assignment

UART	Use recommended by the manufacturer
UART1	video transmitter – digital (HD) and analog
UART2	receiver
UART3, UART4, UART5	GPS or other devices that require a serial port (UART4 is routed to the GPS connector)
UART6	ESC telemetry

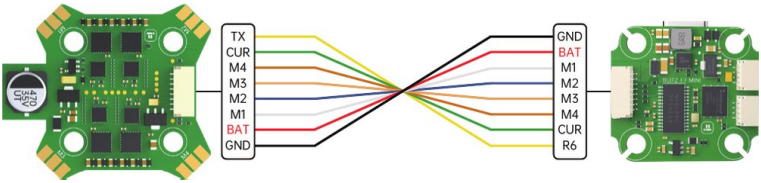
3. Wiring

3.1 General principles

- All diagrams in this chapter come from the manufacturer's original manual. Pin names (T = TX, R = RX, G = GND) correspond to the board's silkscreen.
- TX and RX lines are crossed: the flight controller's TX goes to the device's RX and vice versa.
- Pictures of other components (ESC, video transmitters, receivers, GPS) only illustrate the wiring; these components are not included.
- Before connecting a component, always check the wire order in the cable – it may differ for cables from other manufacturers.

3.2 Electronic speed controller (ESC)

The ESC is connected with an 8-pin SH1.0 cable. The same cable also powers the flight controller (BAT, GND) and carries the current sensor signal (CUR) and ESC telemetry (R6).

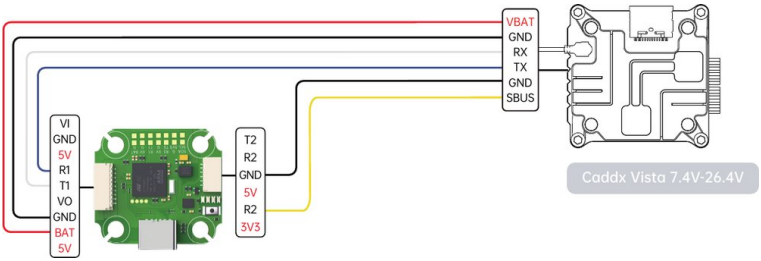


Connecting the flight controller (right) to the ESC (left). The pin order at the two ends is reversed – the cable always connects pins with the same name.

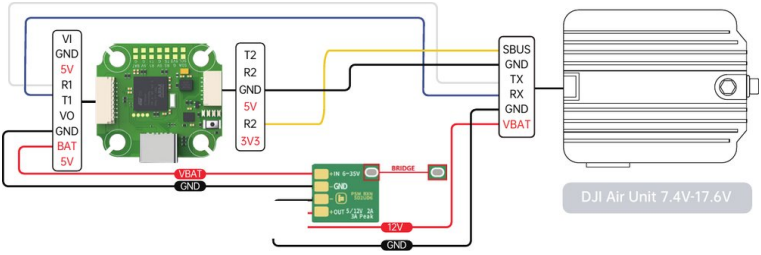
❖ If the pin order of your ESC connector does not match, wire the cable according to the pin names, never just according to pin position.

3.3 DJI and Caddx digital video transmitters

The 6-pin receiver connector and the 9-pin video transmitter connector are plug-and-play compatible with DJI digital transmitters and the Caddx Vista. The supply voltage ranges in the pictures are given by the flight controller manufacturer.

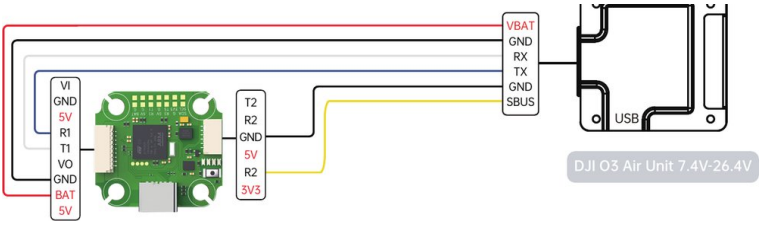


Caddx Vista (7.4–26.4 V).



DJI Air Unit (7.4–17.6 V) powered via a separate voltage regulator (not included).

The DJI plug-and-play connector has a VBAT passthrough. According to the manufacturer, the DJI Air Unit can only handle voltage up to 4S – at higher voltage, power it via a suitable regulator as shown in the picture.

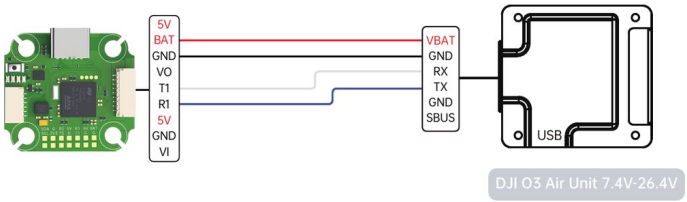


DJI O3 Air Unit (7.4–26.4 V).

- The DJI FPV Remote Controller 2 is for the DJI O3 Air Unit; the DJI FPV Remote Controller is for the DJI Air Unit and Caddx Vista.
- The SBUS signal from the video transmitter is only used when you control the aircraft with a DJI remote controller. The Betaflight settings are described in Chapters 4.2 and 4.5.

3.4 Receiver

The receiver is connected to UART2 (6-pin connector). The manufacturer gives the following examples:

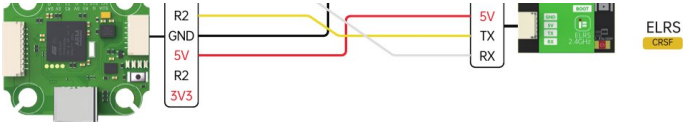


DJI O3 Air Unit without a DJI remote controller – with a separate receiver.

When not using the DJI remote controller, do not connect the SBUS and GND wires (from the 6-pin connector) to the O3 Air Unit.



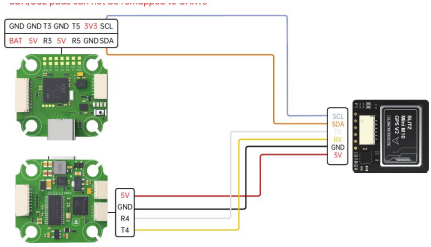
TBS Crossfire Nano receiver – CRSF protocol.



ExpressLRS receiver – CRSF protocol.

3.5 GPS and compass

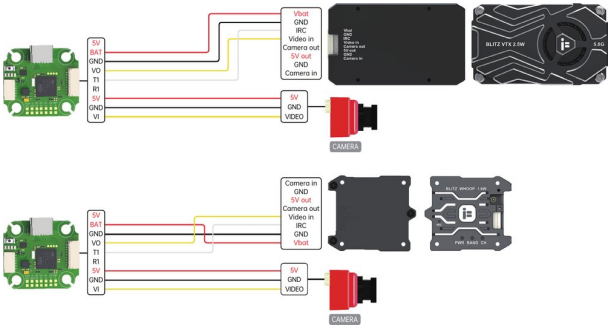
The GPS module is connected to the 4-pin connector (T4 / R4 / G / 5V, i.e. UART4). The compass in the GPS module is connected to the SDA and SCL solder pads (I2C bus). **The SDA/SCL pads cannot be remapped to UARTs.**



Connecting a GPS module with compass: GPS data to the UART4 connector, compass to the SDA/SCL pads.

3.6 Analog video transmitter and camera

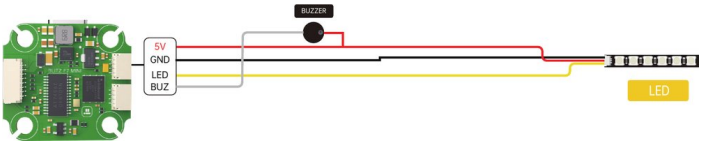
An analog video transmitter and camera are connected to the 9-pin connector: VO = video output to the transmitter, VI = video input from the camera. The T1 wire is used to control the transmitter (IRC Tramp / SmartAudio).



Wiring examples for iFlight BLITZ analog video transmitters and a camera (components not included).

3.7 LED strip and buzzer

An addressable LED strip (WS2812) and a buzzer are connected to the 4-pin connector BUZ− / LED / G / 5V. The buzzer's positive lead goes to 5V, the negative lead to BUZ−.



Wiring the buzzer and LED strip.

4. Configuration and firmware

4.1 Connecting to a computer

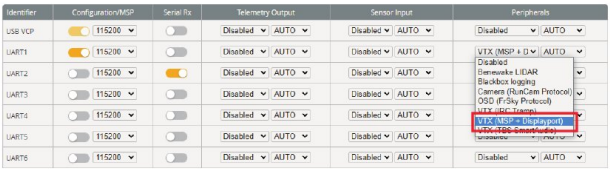
- Remove the propellers. Connect the flight controller to the computer with a USB-C cable that has data lines.
- Start *Betaflight Configurator* (or another configurator for the chosen firmware) and connect to the flight controller.
- After every change, click *Save* (on the *CLI* tab, enter the *save* command).

4.2 Ports and receiver

On the *Ports* tab, set the UARTs according to the connected devices. For the receiver, enable *Serial Rx* on UART2. On the *Receiver* tab, select *Receiver Mode*: *Serial (via UART)* and choose the receiver protocol in the *Serial Receiver Provider* field:

- **DJI (DJI remote controller):** SBUS,
- **TBS Crossfire, ExpressLRS:** CRSF; for these receivers the manufacturer shows telemetry (*Telemetry*) switched on.

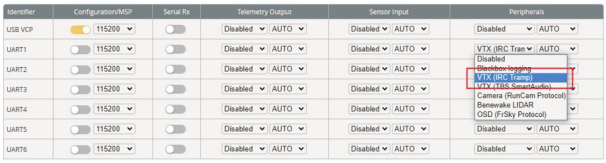
To enable the air unit OSD in DJI goggles, select *VTX (MSP + Displayport)* in the *Peripherals* column on the *Ports* tab for UART1 (the port the video transmitter is connected to).



Ports tab: UART1 – VTX (MSP + Displayport), UART2 – Serial Rx.

4.3 Video transmitter

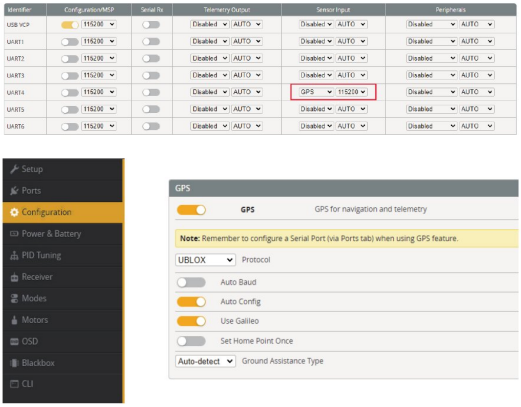
For an analog video transmitter, select the protocol used by the transmitter in the *Peripherals* column on the *Ports* tab for UART1 – *VTX (IRC Tramp)* or *VTX (TBS SmartAudio)*.



Ports tab: UART1 – VTX (IRC Tramp).

4.4 GPS

On the *Ports* tab, set *GPS* and a speed of *115200* in the *Sensor Input* column for UART4. On the *Configuration* tab, enable the *GPS* feature. In the manufacturer's example, the *UBLOX* protocol is used, *Auto Config* and *Use Galileo* are switched on and *Auto Baud* and *Set Home Point Once* are switched off.



GPS settings in Betaflight.

4.5 SBUS protocol with DJI systems

If the DJI remote controller does not work, check your protocols – the DJI goggle protocol and the Betaflight protocol must match. For lower latency, the SBUS BAUD FAST option can be used at both ends:

① In the DJI goggles, enable SBUS BAUD FAST.

② In Betaflight, on the *CLI* tab, enter *set sbus_baud_fast=on* and press Enter.

③ Enter *save* and press Enter.

Default: *sbus_baud_fast=off*, goggle protocol set to NORMAL.

4.6 Firmware

Firmware	Target / board
Betaflight	IFLIGHT_BLITZ_F7_AIO
ArduPilot	arduplane_with_bl (original manual); the manufacturer's website gives BLitzMiniF745
INAV	no target given by the manufacturer

- The firmware version may vary between production batches.
- Before updating, save a backup of your settings (in Betaflight with the *diff all* command on the *CLI* tab).

- If the flight controller does not connect after a failed update, connect it to the computer while holding the **BOOT** button – it starts in bootloader (DFU) mode and the firmware can be flashed again.
- Always select the correct target from the table when updating. A wrong target may cause some pins not to work.

4.7 Further documentation

Official documentation: www.expresslrs.org, betaflight.com, ardupilot.org.

5. Commissioning

5.1 First power-up

- Remove the propellers.
- Connect the battery (through short-circuit protection for the first power-up) or the USB cable.
- Check the indicator LEDs according to Chapter 2.5. If anything gets hot, smokes or the LEDs do not light up, disconnect the battery immediately and check the wiring.

5.2 Orientation and accelerometer calibration

- On the *Setup* tab, check that the model on the screen tilts the same way as the drone. If not, adjust the board orientation (*Board Orientation*) on the *Configuration* tab.
- Place the drone on a flat, level surface and run *Calibrate Accelerometer*.

5.3 Motor check

- **Without propellers**, accept the warning on the *Motors* tab and spin up motors M1–M4 one by one.
- Check that the motor order matches the diagram on the *Motors* tab and that each motor spins in the correct direction. The direction can be changed in the ESC configuration or by swapping two motor wires.
- On the *Receiver* tab, check that all channels respond in the correct direction.

5.4 Arm, Disarm and failsafe

- On the *Modes* tab, assign the **Arm** function (motors on) to a switch on your radio. The opposite switch position means **Disarm** (motors off).
- On the *Failsafe* tab, set the behaviour on signal loss. Test failsafe without propellers: when you switch the radio off, the motors must stop.
- Before the first flight, check that with the throttle stick down the motors only spin at idle speed after switching to Arm.

6. Operating the assembled drone

6.1 The law of the country where you fly applies

Regulations (EU) 2019/947 and 2019/945 apply in all member states of the European Union, but national implementing rules differ from country to country – registration portals, minimum pilot age, geographical zones, compulsory insurance, permitted frequency bands and maximum transmitting power. The information in this chapter describes the situation in the Czech Republic. If you operate the drone in another country, you must follow the regulations of the country in which you fly.

6.2 Basic rules in the Czech Republic

- A drone built with this flight controller has no class label (C0–C4). It is operated as a privately built unmanned aircraft system in the open category – in subcategory A1 with a take-off mass below 250 g, otherwise in subcategory A3 – or within a model aircraft club.
- If the drone has a camera, the operator must register and display the registration number on the drone, regardless of its weight.
- Fly no higher than 120 m above the ground, within visual line of sight and never over assemblies of people. In subcategory A3, keep a distance of 150 m from residential, commercial, industrial and recreational areas.
- When flying with FPV goggles, an observer who watches the drone directly with their own eyes must stand next to the pilot.
- The user is responsible for the transmitting power and frequency settings of the video transmitter and radio system. Observe the limits valid in the country of operation.
- We recommend taking out liability insurance for damage caused by operating the drone.

7. Maintenance and troubleshooting

7.1 Maintenance and storage

- After a crash, check the board, connectors and cables – especially for torn-off wires and cracked solder joints.
- Protect the board from moisture, dust and dirt. Do not power up wet electronics; let them dry thoroughly.
- Store in a dry place at room temperature with the battery disconnected.

7.2 Troubleshooting

Problem	Possible cause and solution
The computer does not recognise the flight controller	Use a different USB-C cable (it must have data lines) and a different port. Check the drivers; as a last resort, connect while holding the BOOT button.
No LED lights up	Check the power supply from the ESC (BAT, GND) and the USB cable. If you suspect a short circuit, disconnect the battery immediately.
Receiver does not respond	Check the TX/RX wiring (crossed), *Serial Rx* on UART2 and the protocol on the *Receiver* tab. Check that the receiver is bound to the radio.
DJI remote controller does not respond	Match the protocol in the DJI goggles and in Betaflight (Chapter 4.5).
No OSD in the DJI goggles	Set *VTX (MSP + Displayport)* on UART1.
Analog VTX channels cannot be changed	Check the T1 wire and the protocol (IRC Tramp / SmartAudio) on the *Ports* tab.
GPS does not find satellites	Check UART4 (*GPS*, 115200) and that GPS is enabled on the *Configuration* tab. The first fix outdoors under open sky may take several minutes.
Motors spin incorrectly or in the wrong direction	Check the motor order on the *Motors* tab and the direction setting in the ESC.

8. Information for the EU and Czech Market

8.1 Importer and responsible person in the EU

The product is placed on the European Union market by the importer stated below, who is at the same time the responsible person within the meaning of Article 16 of Regulation (EU) 2023/988 of the European Parliament and of the Council on general product safety (GPSR).

Importer / responsible person in the EU	Rotorama, s.r.o.
Company ID (IČO)	051 57 692
VAT ID (DIČ)	CZ05157692
Registered office	Okrajová 1351, 674 01 Třebíč, Czech Republic
E-mail	info@rotorama.cz
Phone	+420 252 252 098
Website	www.rotorama.com

8.2 Product conformity

CE

- The product bears the **CE** marking and complies with the requirements of the applicable European Union harmonisation legislation.
- A copy of the **EU Declaration of Conformity** is available from the importer at the address stated above or at the e-mail address info@rotorama.cz.
- **Product identification:** the type designation (BLITZ Mini F745) is given on the product packaging and in this manual.

8.3 Disposal of electrical equipment



- The crossed-out wheeled bin symbol on the product, its packaging or in the documentation means that at the end of its service life the product **must not be disposed of together with mixed municipal waste**.
- Hand it over at a take-back point for electrical equipment – at a collection yard, at a take-back point of a collective system, or at the retailer when purchasing a new equivalent product. Take-back is free of charge for the end user.
- The obligations under Act No. 542/2020 Coll., on end-of-life products, are fulfilled by the importer through a collective take-back system.
- Proper disposal helps prevent negative impacts on the environment and human health and contributes to the reuse of secondary raw materials.

Through its contractual partner **ASEKOL a.s.**, the company ensures the take-back of waste electrical equipment from households and the separate collection of waste electrical equipment, batteries and accumulators in accordance with the applicable legislation. The customer is entitled to hand over old electrical equipment or a battery or accumulator at any collection point of the above contractual partner. The addresses of these take-back points are listed at www.asekol.cz, www.ecobat.cz and also https://visoh2.mzp.cz/RegistrMistZO/RegistrMistZOPublic/MapaMistZpetOdberu.

9. Warranty and rights arising from defective performance

The rights and obligations of the contracting parties are governed by Czech law, in particular by Act No. 89/2012 Coll., the Civil Code, and Act No. 634/1992 Coll., on consumer protection.

- The seller is liable to the buyer for the product being free of defects on receipt. If the buyer is a consumer, a defect may be notified **within two years of receipt** of the product (Section 2165 of the Civil Code).
- If a defect appears within **one year** of receipt, the product is deemed to have been defective already at the time of receipt (Section 2161(5) of the Civil Code).
- When purchasing online, a consumer has the right to **withdraw from the contract within 14 days** of receiving the goods without giving a reason (Section 1829 of the Civil Code).
- Claims should be made with the retailer from whom you purchased the product. The importer's contact details are given in Chapter 8.1.
- The competent body for out-of-court settlement of consumer disputes is the **Czech Trade Inspection Authority**, Štěpánská 796/44, 110 00 Prague 1, www.coi.cz.